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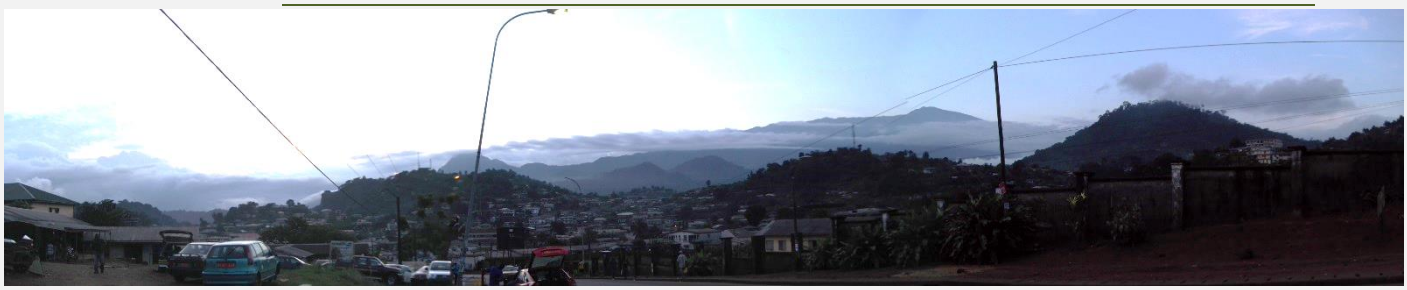
AfReSlide *Newsletter*

AfReSlide - Landslides in Equatorial Africa:
Identifying culturally, technically and economically feasible resilience strategies



Dear reader,

The AfReSlide project team has now been active for two years in understanding the challenges that landslides pose to rural and urban communities in Uganda and Cameroon, trying to identify, with the local actors, the most rational strategies to reduce these negative impacts. Thanks to the collaboration with many in Uganda and Cameroon, but also with international scientists, I am proud to be able to report that AfReSlide has already produced very relevant outputs. For the first time landslides have been inventorized and characterized in detail over large areas in Mt. Rwenzori, Mt. Elgon and Mt. Bamboutos. As reported in this newsletter, the analysis of the survey of smallholder famers in the Rwenzori is producing the first assessment of the economic impact of landslides on households' income. The governance of landslide risk management has been investigated across Uganda. Implementation of landslide risk zonation into land use planning policy is now being investigated in the specific case of Limbe city in Cameroon. Additionally, the interactions with cultural leaders of the Bakonzo group in the Rwenzori has resulted in a better understanding of the cultural premises controlling disaster management and land tenure. A specific attention is also given to plants used in traditional rituals and in coping with natural hazards. These research progresses have been presented at several conferences in 2015 and five scientific papers have recently been submitted for publication in international journals. But we know that this is far from sufficient….

In the second part of the AfReSlide project, we will continue working hard in producing scientific results directly relevant for policy makers, in the form of easy-to-read susceptibility or risk maps, or practical recommendations to face future landslide risk. Potential risk reduction strategies will be assessed for their efficiency and applicability with the local communities as well as with international experts.

News flash

- In Mt. Elgon, a deep-seated landslide occurred on July 2012, killing 8 persons, injuring 4 persons and displacing over 329 persons. It was triggered by heavy rainfall and the estimated volume of displaced soil is 608,000 m^3.

Figure 1: (Tamale, 2015)

Provide us with your observations on these or other events in your region!

Belgian Science Policy Office
belspo

But above all, we will continue to closely involve the impacted communities and their stakeholders in shaping the final results of AfReSlide. New stakeholders' workshops will take place early February in the Rwenzori. Our researchers will be present in the different study areas during 2016. Your suggestions and contributions in enhancing the impact of the project through various communication actions are highly welcome. I wish you all a successful 2016!

Matthieu Kervyn – AfReSlide coordinator

We need your input!

In case you have information to share about landslides in Uganda or Cameroon, please contact us!

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Income from agriculture reduced by landslides in the Rwenzori mountains

Have you ever wondered what is the main impact of landslides in the Rwenzori Mountains? Well, the main impact is on agricultural production. If a household is affected by a landslide this seriously reduces its income from agriculture! That is the first conclusion we can draw from our analysis on the impact of landslides in the Rwenzori region in Uganda.

Extensive household survey in 2015

As a reminder to our readers, let us recall the steps that were taken to come to this conclusion. Over 450 households have been interviewed in seven sub-counties around the Rwenzori Mountains during a survey that was implemented by K. Mertens in the beginning of 2015. Household heads have been questioned on their agricultural activities, on their experience with landslides and on the various income sources of their household members. Subsequently, all this information has been processed anonymously. This work, which is now yielding its first results, would not have been possible without the active involvement of our enumerators nor without the patient cooperation of the household heads.

Figure 1: Farmer standing at landslide in Mahango sub-county (Maes, 2014)

Landslide impact income from agriculture

Currently, we can confirm the hypothesis that households' livelihoods are seriously affected by landslides in the Rwenzori region. On average, affected households have 20% less income from agriculture and this loss can be attributed to the direct consequences of a landslide on their plot. This effect is most important in the year of the landslide due to the destruction of crops. Less pronounced, but still notable, a similar trend in income can be found among households affected by a landslide one, two or three years ago. The impact of landslides on income from agriculture is most significant among households owning one plot only. The good news is that the landslides in the Rwenzori region do not seem to frequently take human lives or destroy critical infrastructure.

Coping strategies

To compensate for the loss of income from agriculture, we find indications that members of affected households adopt jobs as daily laborers. Often these jobs consist of small, temporary tasks performed on the plots of other farmers. These jobs are necessary, but presumably not sufficient, to provide the income needed to sustain the family.

Recommendations

Although results are still preliminary, we can already suggest some recommendations. As the impact of landslides on household income is substantial, a landslide relief fund providing compensation for the affected households in the year of the landslide is desirable. To target relief we should first identify which household characteristics determine whether a household is able to cope with the income losses or not. Our current results indicate that households with only one plot and with a limited amount of land are most vulnerable. To increase the capacity of households to find alternative income sources after a landslide occurs, the government could promote the availability of decent, low-skilled jobs outside agriculture in the rural areas affected by landslides. Other policy recommendations worth considering are still being investigated. We will keep you updated as soon as new findings are available!

Improving expertise in Perugia

In September 2015, L. Jacobs had the opportunity to visit the CNR-IRPI team in Perugia, Italy. This research team has a long-standing tradition and worldwide reputation in landslide susceptibility and hazard research. For two weeks Lies was able to get acquainted with the scientists working on landslides and their research topics. Likewise, the AfR*e*Slide project was introduced and ideas on landslide susceptibility and hazard analysis in these data-poor regions were exchanged. The focus of this research stay was to investigate possibilities on how to recognize landslides and produce susceptibility maps. During these two weeks the basis for an in-depth methodological collaboration was made. As a result, a future research stay of several months is planned in the summer of 2016. We want to thank the entire CNR-IRPI team for their enthusiasm and we are looking forward to future collaborations. Special thanks go to Dr. Mauro Rossi for his time devoted to introducing us to the developments made by CNR-IRPI in landslide susceptibility mapping and for the very useful methodological suggestions that are surely extremely valuable to the AfR*e*Slide project. The produced landslide susceptibility maps can serve as a starting point for policy measures as they will show which areas, at regional and local level, are more prone or less prone to landslides. They will also form the basis on which estimates of landslide hazard and finally landslide risk will be made.

Landslide hazard and risk assessment in Mount Elgon Region, East Uganda

Within the framework of the VLIR-Team Project "SuReLive – Sustainable land use and resilient livelihoods in the landslide-prone region of Mt. Elgon, Uganda", J. Tamale (Ph.D student, KU Leuven & Busitema University) and M. Maertens (Msc. student, KU Leuven) conducted an extensive field campaign between July and September 2015 in the Mt. Elgon Region, Eastern Uganda. The landslide data collected within this campaign will be highly valuable for both the Belspo-AfReSlide and the VLIR-Sure Live project. The goal of the campaign was to make a detailed landslide inventory of the past and recent landslide events in the Elgon region. Field work was concentrated in the eight landslide-prone districts (i.e Bududa, Manafwa, Mbale, Sironko, Bulambuli, Kapchorwa, Kween, and Bukwo) of Mt. Elgon region. Documentation was made on the general (especially location), morphological (dimensions of the landslide scarp), and topographical characteristics of the mapped landslides. In total, 206 landslides (both shallow and deep seated, rotational and translational, debris slides and earth slides) were mapped with field photographs taken for most of the landslides. Prof. J. Poesen (copromotor of both the VLIR-SuReLive and Belspo-AfReSlide project) and Prof. S. Deckers (copromotor of the VLIR-SuReLive project) visited the landslide mapping team in the field between 15th-19th, September 2015. The landslide mapping team shared its field experiences with them, and in return they gave technical guidance on geology of the study area and deeper insights on the nested system landslides. From the field investigations, three sample study areas have been delineated based on geology and topography. Efforts are now underway to complete the landslide inventory using the available SRTM contour map, hillshade map, Google earth imagery, aerial photograph interpretation and toposheets that cover the delineated areas. This is intended to improve the quality and completeness of the landslide inventory. Michiel will then attempt to model landslide susceptibility using logistic regression for his Master thesis. The map will later on be validated by a prospective Msc. student under the supervision of both Joseph and Prof. Poesen. Aside from that, Joseph is in parallel developing a methodology for consequence analysis to be implemented in the summer of 2016. With this data, we ultimately aim at making accurate and reliable risk maps for the Mt. Elgon region to steer land use policy formulation and regulation in the landslide-prone districts. Finally, on behalf of the landslide mapping team, allow us to extend our sincere gratitude to everyone that provided any form of help before, during and after field work in Elgon and of course to the agencies that provided the funding for Joseph's Phd. research and field campaign (i.e. VLIR and Belspo). Thank you so much.

Figure 2. The landslide mapping team in Mt Elgon during field work (Tamale, 2015). From L-R: J. Tamale (Ph.D. Researcher), M. Maertens (Msc. Geography), and Mr. T. Daniel (Local research enumerator)

From risk assessment to risk zonation in Limbe, SW Cameroon

In the summer of 2015, one of our PhD students, J. Maes, went to Limbe city to investigate its disaster risk zonation policy. Based on extensive literature review (Maes et al., submitted) we found that the most recommended landslide risk reduction strategy in the tropics is landslide risk zonation. Because its implementation is scarcely documented in scientific literature, we decided to search for a case-study to draw lessons learned, to see why this strategy is widely recommended and to analyze what are the challenges for its implementation. Through a previous mission in Cameroon with the AfReSlide partners in May 2014, we learned that in the city of Limbe certain risk zones have been installed to prevent people from settling in hazard-prone areas. Consequently, we conducted field work in Limbe in collaboration with the University of Buea. We follow a political ecology perspective using participatory social science methods (Table 1). Preliminary analysis show that although much risk information (e.g. hazard maps) is available and many projects are active in Limbe, risk zonation is ineffective: the use of maps is limited. Even stronger, there is little interest in project outcomes. It seems that if political and socio-economic conditions are not considered in implementing these risk zonation policies, these are doomed to fail.

Table 1. Actors interviewed

Category	Actor
Authorities	Ministry of Town Planning and Housing
	Ministry of Territorial Administration and Decentralisation
	Ministry of Defence
	Ministry of Public Health
	Ministry of Social Affairs
	Ministry of Scientific and Technical Research
	Ministry of Environment
	Limbe City Council (LCC) and three municipalities
	Quarter heads
Scientists	University of Buea and Limbe Botanic Garden
NGOs	Cameroon Red Cross
	CSOs like OGCEYOD, GEADIRR and CADJAD
	Projects like IRCOD and MIAVITA
Priv. sector	CDC, SONARA, HYSACAM
Citizens	People living in risk zones

Land degradation in the Rwenzori Mountains

In the frame of the VLIR SI project, J. Sekajugo (Msc. Student Busitema University) is compiling, since November 2013, an inventory of the different land degradation processes in the districts of Kasese, Kabarole and Bundibugyo. The three major land degradation processes in these districts are landslides, flash floods and excessive erosion by water. The most affected sub-counties are Kateebwa, Kabonero and Karangura for Kabarole district; Mahango, Kyarumba, Bugoye, Bulembia, Buhuhira, Ihandiro, Karusandara and Muhokya for Kasese district; then Kirumya, Bubukwanga, Kasitu,Ntotoro, Ngamba, Bukonzo, Bubandi and Busaru for Bundibugyo district. Although landslides in the Rwenzori have not yet received as much attention as in the Mt. Elgon region, it seems that they become increasingly disastrous, especially in Bundibugyo district. Particularly when these combine with flash floods, e.g. of the Mubuku, Nyamwamba and Nyamugasani rivers, the livelihoods of people become greatly affected. The most important triggering factor for land degradation processes in the region is heavy rainfall. For example rainfall in May 2013, but even this year's El Niño episode from late October 2015 has triggered numerous disastrous landsides particularly in Bundibugyo district which leaves large gardens of cocoa as well as houses destroyed. What the flash floods concern, most damage and destruction of crops and infrastructure occurred within 15 to 50m from the river banks. This means that people are encroaching on the buffer zones of these rivers. Since the last flood and landslide instances of May 2013 in Kilembe, both official and casual visits by government and nongovernment agencies were plenty. This attention initially raised the hopes of local people for future interventions. However, these people have lost hope as they feel nothing has been done to help them. As a result, many of them feel demotivated to participate in other subsequent research work and assessments because they don't see direct benefits from such assessments and investigations. To ensure sustainability for research in this region, it is important that the project developers consider mixing in practical interventions as project activities so that local people do not perceive them as intentions for academic purposes only.

Upcoming missions & conferences

In the following months, research is planned in Uganda:

- Stakeholder workshops organized by AfReSlide partners in the Rwenzori Mountains in January 2016.
- Field work on landslide inventory in the Rwenzori Mountains by L. Jacobs in February 2016.

Scientific output

1. Publications

- Jacobs, L., Dewitte, O., Poesen, J., Delvaux, D., Thiery, W., Kervyn, M., 2015. The Rwenzori Mountains, a landslide-prone region?. Landslides, doi: 10.1007/s10346-015-0582-5. [I.F. 2.870]

2. Conference presentations

Research of the AfReSlide project was presented:
At the Belgian Geography Days, Brussels, 13-14 November 2015:

- Maes, J., Kervyn, M., Vranken, L., Dewitte, O., de Hontheim, A., Vanmaercke, M., Mertens, M., Jacobs, L. and Poesen, J. Landslide risk reduction strategies: A review of practices and challenges for the tropics.
- Jacobs, L., Dewitte, O., Poesen, J., Sekajugo, J., Maes, J., Mertens, K. and Kervyn, M. A first landslide inventory in the Rwenzori Mountains, Uganda.
- Mertens, K., Maes, J., Jacobs, L., Kervyn, M., Kabaseke, C., Vranken, L. The differential impact of landslides on smallholder farmers in the Rwenzori Mountains, Uganda.

At the conference of the American Anthropological Association (AAA), Denver (USA), 18-22 November 2015:

- de Hontheim, A. Coping with the Invisible: Some Bakonzo Cultural Responses to Natural Disasters in the Rwenzori.

Thank you note

We would like to thank all of you for your cooperation. This project would not be possible without the input of many participants during the extensive fieldwork. It is vital to this project that all different views are included. We also want to show their gratitude to the technical staff of LCC and researchers of UBuea. Special thanks go to Mr. Nana Celestin of FASTDAM and Mr. Jeff Molombe for their critical view on scientific research in Limbe.